UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/537,509 | 11/30/2005 | Fumitsugu Fukuyo | 46884-5388 (211285) | 4531 |

23973 7590 10/18/2010

DRINKER BIDDLE & REATH
ATTN: INTELLECTUAL PROPERTY GROUP
ONE LOGAN SQUARE, SUITE 2000
PHILADELPHIA, PA 19103-6996

| EXAMINER | |
|---|---|
| ULLAH, ELIAS | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2892 | |

| NOTIFICATION DATE | DELIVERY MODE |
|---|---|
| 10/18/2010 | ELECTRONIC |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

DBRIPDocket@dbr.com
penelope.mongelluzzo@dbr.com

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/537,509 | FUKUYO ET AL. | |
| | Examiner | Art Unit | |
| | ELIAS ULLAH | 2892 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *21 July 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-3,5,7-9,11-35,37-48,50-55 and 57-59* is/are pending in the application.

4a) Of the above claim(s) *23-32,40 and 41* is/are withdrawn from consideration.

5)☐ Claim(s) _ is/are allowed.

6)☒ Claim(s) *1-3,5,7-9,11-13 15-22, 33-35, 37-39, 42-48, 50--55 and 58-59* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :3/1/10, 3/9/10, 3/19/10, 4/30/10, 6/2/10, 6/24/10, 7/21/10,8/10/2010, 8/20/2010, 9/01/2010, 9/16/2010.

## DETAILED ACTION

This office action is in response to an amendment filed on 7/21/2010.

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1, 3, 5, 7, 9, 11-13,15, 17,19, 21-22, 33, 35, 37, 39, 42-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoekstra et al. (Hoekstra, US 6,420,678) in view of Umehara et al (Umehara, US 5,882,956) all of record.

With regard to claims 1, 3, and 42 Hoekstra teaches a substrate dividing method comprising the method of cutting a semiconductor substrate, the method comprising the steps of irradiating a semiconductor substrate 4 (Fig. 4, lines 59-61), having a wavelength (col. 6, lines 24-27) that enables the laser light 34 (Fig. 4, col. 5, lines 45-

50) to transmit ( at wave length of 1.06 um a laser light can transmit through the substrate which is identical applicant disclosed wave length (see [0066] of instant application publication 2006/0148212) through the semiconductor substrate 4, while locating a light-converging point 35 within the semiconductor substrate 4, so as to form a modified region ( wherein void 37 is formed), the modified region forming a part which is intended to be cut 45 ( Fig. 4 with respect to Fig. 16);

Hoekstra further teaches a sheet 112, but fails to teach the sheet bonded thereto by way of a die- bonding resin layer and expanding the sheet forming the part which is intended to be cut, to cut and separate the semiconductor substrate with the die-bonding resin layer bonded thereto into adjacent separated portions of the semiconductor substrate each having at least a portion of the die-bonding resin layer bonded thereto, so as to form a gap between the adjacent portions of the semiconductor substrate, so as to cut and separate at least the semiconductor substrate and die bonding resin layer along the part which is intended to be cut, wherein the die bonding resin layer is torn apart along with the semiconductor substrate by expanding the sheet.

Umehara teaches a sheet 10 (Fig. 10) bonded thereto by way of a die- bonding resin layer 4 and expanding the sheet (col. 3, lines 40-45) forming the part which is intended to be cut (Fig. 4), to cut and separate the semiconductor substrate 6 ( Fig. 4 with respect to Fig. 5) with the die-bonding resin layer 4 bonded thereto into adjacent separated portions of the semiconductor substrate 6 (Fig. 5) each having at least a portion of the die-bonding resin layer 4 bonded thereto, so as to form a gap (Fig. 4 with

respect to Fig. 5) between the adjacent portions of the semiconductor substrate 6 , so as to cut and separate at least the semiconductor substrate 6 and die bonding resin layer 4 along the part which is intended to be cut (Fig. 4-5) wherein the die bonding resin layer is torn apart (4 in Fig. 5) along with the semiconductor substrate (4 will inherently comprises substrate) by expanding the sheet (col. 3, lines 40-45). At the time the invention was made, it would have been obvious to a person having ordinary skill in the art substitute Hoekstra's expandable bonding sheet 112 with teaching of Umehara's expanding bonding sheet 10 include a bonding layer 4 in the substrate dividing method of Hoekstra because such bonding layer e.g. layer 4 can be used as a interposed between the IC chips and the lead frame to thereby bond the IC chips to the lead frame thus reduce additional bonding steps as taught by Umehara in (col. 1-10).

Umehara fails to teach expressly “expanding the sheet after the part which is intended to be cut." However, selection of any order of performing process steps (before or after) is *prima facie* obvious in the absence of new or unexpected results; In re Burhans, 154 F.2d 690, 69 USPQ 330 (CCPA 1946); In re Gibson, 39 F2d 975, 5 USPQ 230 (CCPA 1930). MPEP 2144.04.

The recitations of “so as to form a substrate modified region due to multiphoton absorption only within the substrate” is only a statement of the inherent properties of the instant process of Nd:YAG laser pulse. The process recited in “laser processing e.g. ND: YAG” is substantially identical (instant application laser process e.g. Nd:YAG laser see [0066] of instant application publication 2006/0148212) to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and

prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.02.

With regard to claim 5, Hoekstra teaches a method of cutting a semiconductor substrate wherein the modified region (Fig. 4, wherein modified region 37 is formed) is a molten processed region (col. 6, lines 1-3).

With regard to claims 7, 9, Hoekstra teaches a method of cutting a semiconductor substrate wherein a fracture is caused to reach a front face of the semiconductor substrate 4 (col. 6, lines 10-15) on the laser light 34 entrance side from the part which is intended to be cut action as a start point (Fig. 4,).

With regard to claims 11, 13, 15, and 17 Hoekstra teaches a method of cutting a semiconductor substrate wherein a fracture is caused to reach a rear face o the semiconductor substrate 4 (col. 4, lines 40-50) on the side opposite from the laser light entrance side (col. 4, lines 40-50) from the part which is intended to be cut as a starting point (Fig. 4).

With regard to claims 19, 21 and 43, Hoekstra teaches a substrate dividing method comprising the method of cutting a semiconductor substrate, the method comprising the steps of irradiating a semiconductor substrate 4 (Fig. 4, lines 59-61), having a wavelength (col. 6, lines 24-27) that enables the laser light 34 (Fig. 4, col. 5, lines 45-50) to transmit ( at wave length of 1.06 um a laser light can transmit through the substrate which is identical applicant disclosed wave length (see [0066] of instant

application publication 2006/0148212) through the semiconductor substrate 4, while locating a light-converging point 35 within the semiconductor substrate 4, so as to form a modified region ( wherein void 37 is formed), the modified region forming a part which is intended to be cut 45 ( Fig. 4 with respect to Fig. 16); generating a stress ( Fig. 16, col. 11, lines 10-25 wherein curve in y direction with small rise in the elevation at the locations where the substrate 4 will be separate create a stress to the semiconductor) in the semiconductor substrate 4 along the part which is intended to be cut after forming the part which is intended to be cut (Fig. 16).

Hoekstra further teaches a sheet 112, but fails to teach the sheet bonded thereto by way of a die- bonding resin layer and expanding the sheet forming the part which is intended to be cut, to cut and separate the semiconductor substrate with the die-bonding resin layer bonded thereto into adjacent separated portions of the semiconductor substrate each having at least a portion of the die-bonding resin layer bonded thereto, so as to form a gap between the adjacent portions of the semiconductor substrate, so as to cut and separate at least the semiconductor substrate and die bonding resin layer along the part which is intended to be cut, wherein the die bonding resin layer is torn apart along with the semiconductor substrate by expanding the sheet.

Umehara teaches a sheet 10 (Fig. 10) bonded thereto by way of a die- bonding resin layer 4 and expanding the sheet (col. 3, lines 40-45) forming the part which is intended to be cut (Fig. 4), to cut and separate the semiconductor substrate 6 ( Fig. 4 with respect to Fig. 5) with the die-bonding resin layer 4 bonded thereto into adjacent

separated portions of the semiconductor substrate 6 (Fig. 5) each having at least a portion of the die-bonding resin layer 4 bonded thereto, so as to form a gap (Fig. 4 with respect to Fig. 5) between the adjacent portions of the semiconductor substrate 6 , so as to cut and separate at least the semiconductor substrate 6 and die bonding resin layer 4 along the part which is intended to be cut (Fig. 4-5) wherein the die bonding resin layer is torn apart (4 in Fig. 5) along with the semiconductor substrate (4 will inherently comprises substrate) by expanding the sheet (col. 3, lines 40-45). At the time the invention was made, it would have been obvious to a person having ordinary skill in the art substitute Hoekstra's expandable bonding sheet 112 with teaching of Umehara's expanding bonding sheet 10 include a bonding layer 4 in the substrate dividing method of Hoekstra because such bonding layer e.g. layer 4 can be used as a interposed between the IC chips and the lead frame to thereby bond the IC chips to the lead frame thus reduce additional bonding steps as taught by Umehara in (col. 1-10).

The recitations of “so as to form a substrate modified region due to multiphoton absorption only within the substrate” is only a statement of the inherent properties of the instant process of Nd:YAG laser pulse. The process recited in “laser processing e.g. ND: YAG” is substantially identical (instant application laser process e.g. Nd:YAG laser see [0066] of instant application publication 2006/0148212) to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of

either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.02.

With regard to claim 22, Hoekstra teaches a method of cutting a semiconductor substrate wherein the modified region (Fig. 4, wherein modified region 37 is formed) is a molten processed region (col. 6, lines 1-3).

With regard to claims 33, 35-37, 39 and 44-45, Hoekstra teaches a substrate dividing method comprising the method of cutting a semiconductor substrate, the method comprising the steps of irradiating a semiconductor substrate 4 (Fig. 4, lines 59-61), having a wavelength (col. 6, lines 24-27) that enables the laser light 34 (Fig. 4, col. 5, lines 45-50) to transmit ( at wave length of 1.06 um a laser light can transmit through the substrate which is identical applicant disclosed wave length (see [0066] of instant application publication 2006/0148212) through the semiconductor substrate 4, while locating a light-converging point 35 within the semiconductor substrate 4, so as to form a modified region ( wherein void 37 is formed), the modified region forming a part which is intended to be cut 45 ( Fig. 4 with respect to Fig. 16) generating a stress ( Fig. 16, col. 11, lines 10-25 wherein curve in y direction with small rise in the elevation at the locations where the substrate 4 will be separate create a stress to the semiconductor) in the semiconductor substrate 4 along the part which is intended to be cut after forming the part which is intended to be cut (Fig. 16).

Hoekstra further teaches a sheet 112, but fails to teach the sheet bonded thereto by way of a die- bonding resin layer and expanding the sheet forming the part which is intended to be cut, to cut and separate the semiconductor substrate with the

die-bonding resin layer bonded thereto into adjacent separated portions of the semiconductor substrate each having at least a portion of the die-bonding resin layer bonded thereto, so as to form a gap between the adjacent portions of the semiconductor substrate, so as to cut and separate at least the semiconductor substrate and die bonding resin layer along the part which is intended to be cut, wherein the die bonding resin layer is torn apart along with the semiconductor substrate by expanding the sheet.

Umehara teaches a sheet 10 (Fig. 10) bonded thereto by way of a die- bonding resin layer 4 and expanding the sheet (col. 3, lines 40-45) forming the part which is intended to be cut (Fig. 4), to cut and separate the semiconductor substrate 6 ( Fig. 4 with respect to Fig. 5) with the die-bonding resin layer 4 bonded thereto into adjacent separated portions of the semiconductor substrate 6 (Fig. 5) each having at least a portion of the die-bonding resin layer 4 bonded thereto, so as to form a gap (Fig. 4 with respect to Fig. 5) between the adjacent portions of the semiconductor substrate 6 , so as to cut and separate at least the semiconductor substrate 6 and die bonding resin layer 4 along the part which is intended to be cut (Fig. 4-5) wherein the die bonding resin layer is torn apart (4 in Fig. 5) along with the semiconductor substrate (4 will inherently comprises substrate) by expanding the sheet (col. 3, lines 40-45). At the time the invention was made, it would have been obvious to a person having ordinary skill in the art substitute Hoekstra's expandable bonding sheet 112 with teaching of Umehara's expanding bonding sheet 10 include a bonding layer 4 in the substrate dividing method of Hoekstra because such bonding layer e.g. layer 4 can be used as a interposed

between the IC chips and the lead frame to thereby bond the IC chips to the lead frame thus reduce additional bonding steps as taught by Umehara in (col. 1-10).

The recitations of "so as to form a substrate modified region due to multiphoton absorption only within the substrate" is only a statement of the inherent properties of the instant process of Nd:YAG laser pulse. The process recited in "laser processing e.g. ND: YAG" is substantially identical (instant application laser process e.g. Nd:YAG laser see [0066] of instant application publication 2006/0148212) to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.02.

4. Claims 2, 8, 16, 20, 34, 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoekstra et al. (Hoekstra, US 6,420,678); in view of Umehara et al (Umehara, US 5,882,956) of record and further in view of Piwczyk et al. (US 6,376,797) of record.

With regard to claims 2 , 20, 34 and 38 Hoekstra teaches a substrate dividing method comprising the method of cutting a semiconductor substrate, the method comprising the steps of irradiating a semiconductor substrate 4 (Fig. 4, lines 59-61), having a wavelength (col. 6, lines 24-27) that enables the laser light 34 (Fig. 4, col. 5, lines 45-50) to transmit ( at wave length of 1.06 um a laser light can transmit through the substrate which is identical applicant disclosed wave length (see [0066] of instant

application publication 2006/0148212) through the semiconductor substrate 4, while locating a light-converging point 35 within the semiconductor substrate 4, and the substrate is irradiate with a pulse width of 1us or less (col. 6, lines 26-30) so as to form a modified region ( wherein void 37 is formed), the modified region forming a part which is intended to be cut 45 ( Fig. 4 with respect to Fig. 16); generating a stress ( Fig. 16, col. 11, lines 10-25 wherein curve in y direction with small rise in the elevation at the locations where the substrate 4 will be separate create a stress to the semiconductor) in the semiconductor substrate 4 along the part which is intended to be cut after forming the part which is intended to be cut (Fig. 16).

Hoekstra further teaches a sheet 112, but fails to teach the sheet bonded thereto by way of a die- bonding resin layer and expanding the sheet forming the part which is intended to be cut, to cut and separate the semiconductor substrate with the die-bonding resin layer bonded thereto into adjacent separated portions of the semiconductor substrate each having at least a portion of the die-bonding resin layer bonded thereto, so as to form a gap between the adjacent portions of the semiconductor substrate, so as to cut and separate at least the semiconductor substrate and die bonding resin layer along the part which is intended to be cut, wherein the die bonding resin layer is torn apart along with the semiconductor substrate by expanding the sheet.

Umehara teaches a sheet 10 (Fig. 10) bonded thereto by way of a die- bonding resin layer 4 and expanding the sheet (col. 3, lines 40-45) forming the part which is intended to be cut (Fig. 4), to cut and separate the semiconductor substrate 6 ( Fig. 4

with respect to Fig. 5) with the die-bonding resin layer 4 bonded thereto into adjacent separated portions of the semiconductor substrate 6 (Fig. 5) each having at least a portion of the die-bonding resin layer 4 bonded thereto, so as to form a gap (Fig. 4 with respect to Fig. 5) between the adjacent portions of the semiconductor substrate 6 , so as to cut and separate at least the semiconductor substrate 6 and die bonding resin layer 4 along the part which is intended to be cut (Fig. 4-5) wherein the die bonding resin layer is torn apart (4 in Fig. 5) along with the semiconductor substrate (4 will inherently comprises substrate) by expanding the sheet (col. 3, lines 40-45). At the time the invention was made, it would have been obvious to a person having ordinary skill in the art substitute Hoekstra's expandable bonding sheet 112 with teaching of Umehara's expanding bonding sheet 10 include a bonding layer 4 in the substrate dividing method of Hoekstra because such bonding layer e.g. layer 4 can be used as a interposed between the IC chips and the lead frame to thereby bond the IC chips to the lead frame thus reduce additional bonding steps as taught by Umehara in (col. 1-10).

The recitations of “so as to form a substrate modified region due to multiphoton absorption only within the substrate” is only a statement of the inherent properties of the instant process of Nd:YAG laser pulse. The process recited in “laser processing e.g. ND: YAG” is substantially identical (instant application laser process e.g. Nd:YAG laser see [0066] of instant application publication 2006/0148212) to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of

either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.02.

Hoekstra and Umehara fail to teach the substrate is irradiated with the laser light under a condition with a peak power density of at least 1 x $10^8$ (W/cm2).

Piwczyk teaches Nd: YAG laser with a peak power density of 9 x $10^9$ W/$cm^2$ for creating micro crack (col. 4, lines 20-40). At the time the invention was made, it would have been obvious to a person having ordinary skill in the art to use a Nd: YAG laser with a peak power density of 9 x $10^9$ W/$cm^2$ for creating micro crack teaching of Piwczyk in the laser processing method of Hoekstra because Hoekstra Nd: YAG laser (col. 6, lines 24-30) can be used for a peak power density of 9 x $10^9$ W/$cm^2$ for creating micro crack for cutting a substrate.

With regard to claim 8, Hoekstra teaches a method of cutting a semiconductor substrate wherein a fracture is caused to reach a front face of the semiconductor substrate 4 (col. 6, lines 10-15) on the laser light 34 entrance side from the part which is intended to be cut action as a start point (Fig. 4).

With regard to claim 16, Hoekstra teaches a method of cutting a semiconductor substrate wherein a fracture is caused to reach a rear face o the semiconductor substrate 4 (col. 4, lines 40-50) on the side opposite from the laser light entrance side (col. 4, lines 40-50) from the part which is intended to be cut as a starting point (Fig. 4).

5. Claims 46, 48, 50, 52, 53, 55, 57, 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoekstra et al. (Hoekstra, US 6,420,678) in view of Umehara

et al (Umehara, US 5,882,956) as applied above claim 1 and further in view of Negoro ( US 5,411,921) all of records.

With regard to claims 46, 48, 50, 52, 53, 55, 57 and 59, Hoekstra and Umehara do not expressly teach the sheet is expanded by pulling peripheral portion of the sheet outwardly.

However, Negoro teaches a semiconductor wafer is diced into chip (Figs. 1-4) wherein a expandable sheet expended by pulling peripheral portion of the sheet outwardly (col. 2, line 66+ and col. 3 line 1+ wherein tape pull by vacuum). At the time the invention was made, it would have been obvious to a person having ordinary skill in the art to separate a chip from tape by pulling teaching of Negoro in the Hoekstra and Umehara laser cutting, because such pulling e.g. vacuum process expend the plastically and the semiconductor chips will be parted from each other as taught by Negoro in (Fig. 3 and col. 3, line 1+).

6. Claims 47, 51, 54 and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoekstra et al. (Hoekstra, US 6,420,678); in view of Umehara et al (Umehara, US 5,882,956) of record and further in view of Piwczyk et al. (US 6,376,797) as applied above claim 1 and further in view of Negoro ( US 5,411,921) all of records.

With regard to claims 47, 51, 54 and 58, Hoekstra, Umehara and Piwczyk do not expressly teach the sheet is expanded by pulling peripheral portion of the sheet outwardly.

However, Negoro teaches a semiconductor wafer is diced into chip (Figs. 1-4) wherein a expandable sheet expended by pulling peripheral portion of the sheet

outwardly (col. 2, line 66+ and col. 3 line 1+ wherein tape pull by vacuum). At the time the invention was made, it would have been obvious to a person having ordinary skill in the art to separate a chip from tape by pulling teaching of Negoro in the Hoekstra and Umehara laser cutting, because such pulling e.g. vacuum process expend the plastically and the semiconductor chips will be parted from each other as taught by Negoro in (Fig. 3 and col. 3, line 1+).

### *Response to Arguments*

7. Applicant's arguments filed 7/21/2010 have been fully considered but they are not persuasive. Applicants' arguments in the remarks page 35-25 are directed to amended claims features, thus Applicants are respectfully referred to review above rejection In light of claims amendments.

8. Applicant's arguments see remarks pages 23-24, filed on 7/21/2010, with respect to nonstatutory obviousness type double patenting have been fully considered and are persuasive. The nonstatutory obviousness-type double patenting rejection has been withdrawn.

### *Conclusion*

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ELIAS ULLAH whose telephone number is (571)272-1415. The examiner can normally be reached on weekdays, between 8AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thao Le can be reached on (571) 272-1708. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Elias Ullah/
Examiner, Art Unit 2892

/Trung Dang/
Primary Examiner, Art Unit 2892